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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/791,909

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EXAMINER

DAHBOUR, HENRY

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/791,909	Applicant(s) LLEWELLYN ET AL.	
	Examiner Henry Dahbour	Art Unit 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-7,9-11,13,15 and 18 is/are rejected.
- 7) ☒ Claim(s) 3,4,8,12,14,16,17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

PPD

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 5-6, 10-11, 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakamura (U.S.6441684).

Regarding claim 1, Nakamura discloses a circuit for interfacing between an image sensor and a processor, comprising a sampler operable to generate a plurality of analog image samples of an image by sampling a signal produced by the image sensor during a scanning of the image (see 102 in Figure 8), a programmable gain amplifier operable to generate a plurality of amplified samples by employing an analog gain to amplify the analog image sample (see 104 in Figure 8), an analog to digital converter operable to generate a plurality of digitized samples by digitizing the amplified samples (see 106 in Figure 8), a digital programmable gain amplifier operable to generate amplified digitized samples for the processor by employing a digital gain to amplify the digitized samples (see 700 in Figure 8), wherein the digital gain of the digital programmable gain amplifier at least overlaps the analog gain of the programmable gain amplifier (see Figure 9).

Regarding claim 2, Nakamura discloses a control signal that controls the analog gain and another control signal that controls the digital gain (see 800 & 802 in Figure 8) wherein the digital gain at least overlaps the analog gain for each step along a range of the analog gain (see Figure 9).

Regarding claim 5, Nakamura discloses generating the plurality of amplified digitized samples is performed within a dynamic range that is at least as large as a dynamic range of any one resolution step defined by generating the plurality of amplified image samples (see Figure 9).

Regarding claim 6, Nakamura discloses the image sensor includes at least one of a charge coupled device (CCD) array and a diode (see 100 in Figure 8).

Regarding claim 10, Nakamura discloses a method for interfacing between an image sensor and a processor, comprising generating a plurality of analog image samples by sampling a signal produced by the image sensor during the scanning of an image (see 102 in Figure 8), generating a plurality of amplified samples by amplifying the plurality of analog image samples with an analog gain (see 104 in Figure 8), generating a plurality of digitized samples by digitizing the plurality of amplified samples (see 106 in Figure 8), generating a plurality of amplified digitized samples for the image processor by amplifying the digitized samples with a digital gain (see 700 in Figure 8), wherein the amplified digitized samples are provided to the processor for processing of the scanned image (see 108 in Figure 8).

Regarding claim 11, Nakamura discloses controlling the analog gain and controlling the digital gain (see 800 & 802 in Figure 8), wherein the digital gain at least overlaps the analog gain over a range of the analog gain (see Figure 9).

Regarding claim 13, Nakamura discloses generating the plurality of amplified digitized samples is performed within a dynamic range that is at least as large as a

dynamic range of any one resolution step defined by the generation of the plurality of amplified image samples (see Figure 9).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura (U.S.6441684) in view of Shimizu (U.S.6839153).

Nakamura does not disclose a digital image processor that is operable for a scanning system.

Shimizu discloses this feature (see 21 in Figure 2).

Nakamura and Shimizu are analogous art because they are from the same field of endeavor, that is the art of imaging devices.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the digital image processor of Shimizu with the device of Nakamura.

The suggestion/motivation for doing so is that Shimizu teaches that it would allow for the outputted image data to be "subjected to image processing....which is required in an apparatus such as a digital copying machine and a scanner...." (see lines 65-67 in column 8, and lines 1-2 in column 9).

Therefore, it would have been obvious to combine Nakamura with Shimizu to obtain the invention specified in claim(s) 7.

5. Claims 9, 15 & 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura (U.S.6441684) in view of Beaulieu et al (U.S.5563723).

Nakamura, as described above, discloses all the features claimed except calibrating each of the Programmable Gain Amplifier and the Digital Programmable Gain Amplifier prior to the scanning.

Beaulieu discloses this feature (see "calibration of image scanner signal processing circuits" in title, also see "gain...settings that provide accurate calibration" in line 4 in abstract, also see "including...digital gain" in line 28 in column 9).

Nakamura and Beaulieu are analogous art because they are from the same field of endeavor, that is the art of imaging devices.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the calibration of Beaulieu with the device of Nakamura.

The suggestion/motivation for doing so is that Beaulieu teaches that this feature is known in the art (see "known gain...settings that provide accurate calibration" in lines 3-4 in abstract).

Therefore, it would have been obvious to combine Nakamura with Beaulieu to obtain the invention specified in claim(s) 9, 15 & 18.

Allowable Subject Matter

6. Claims 3-4, 8, 12, 14, 16-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 3, the prior art, either singularly or in combination, does not teach or suggest a device, as claimed in claims 1-2, comprising:

"...the control signal employs a word with a number of bits that are substantially less than a number of bits in another word employed by the other control signal..."

The features identified, in combination with other claim limitations, are neither suggested nor discussed by the prior art of record.

Regarding claim 4, the prior art, either singularly or in combination, does not teach or suggest a device, as claimed in claim 1, comprising:

"...a value of one of a control signal and another control signal is varied for calibrating one of the Programmable Gain Amplifier or the Digital Programmable Gain Amplifier during which another value of the other one of the control signal and the other control signal is maintained relatively constant..."

The features identified, in combination with other claim limitations, are neither suggested nor discussed by the prior art of record.

Regarding claim 8, the prior art, either singularly or in combination, does not teach or suggest a device, as claimed in claim 1, comprising:

"...one of a plurality of calibration algorithms are employed to calibrate the operation of the Programmable Gain Amplifier and the Digital Programmable Gain Amplifier prior to the generation of the plurality of amplified digitized samples for each scanned image..."

The features identified, in combination with other claim limitations, are neither suggested nor discussed by the prior art of record.

Regarding claim 12, the prior art, either singularly or in combination, does not teach or suggest a device, as claimed in claim 10, comprising:

"...varying a value for calibrating one of the analog gain and the digital gain during which another value for calibrating the other one of the analog gain and the digital gain is maintained relatively constant..."

The features identified, in combination with other claim limitations, are neither suggested nor discussed by the prior art of record.

Regarding claim 14, the prior art, either singularly or in combination, does not teach or suggest a device, as claimed in claim 10, comprising:

"...one of a plurality of calibration algorithms are employed to calibrate the operation of the analog gain and the digital gain prior to the generation of the plurality of amplified digitized samples for each scanned image..."

The features identified, in combination with other claim limitations, are neither suggested nor discussed by the prior art of record.

Regarding claim 16, the prior art, either singularly or in combination, does not teach or suggest a device, as claimed in claims 10 & 15, comprising:

"...adjusting the digital gain until it is calibrated while the analog gain is held at a predetermined value, and adjusting the analog gain until it is calibrated while the digital gain is held at its calibrated value..."

The features identified, in combination with other claim limitations, are neither suggested nor discussed by the prior art of record.

Regarding claim 17, the prior art, either singularly or in combination, does not teach or suggest a device, as claimed in claims 10 & 15, comprising:

"...adjusting the analog gain until it is calibrated while the digital gain is held at a predetermined value, and adjusting the digital gain until it is calibrated while the analog gain is held at its calibrated value..."

The features identified, in combination with other claim limitations, are neither suggested nor discussed by the prior art of record.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Suzuki et al, Maruchi et al, Kondo et al ('361), Kondo et al ('075), Kondo et al ('616), Shimizu ('605) and JP-2002-271631 are cited to show imaging devices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Henry Dahbour whose telephone number is 571-272-4295. The examiner can normally be reached on 9:00AM-5:30PM, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Coles can be reached on 571-272-7402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

Art Unit: 2625

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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